

SEQUENCE LISTING

<110> AstaCarotene AB

<120> DNA construct and its use

<130> 29295-AstaCarotene

<140>

<141>

<160> 2

<170> PatentIn Ver. 2.1

<210> 1

<211> 2543

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: napin promoter
+ chloroplast localization signal + beta-carotene C-4 oxygenase
coding sequence + termination sequence

<220>

<221> promoter

<222> (1) .. (1145)

<220>

<221> transit_peptide

<222> (1179) .. (1347)

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<221> CDS

<222> (1179) .. (2217)

<220>

<221> terminator

<222> (2273) .. (2536)

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cagatggcag aaatgtatca accaatgcat atatacaaat gtacctcttg ttctcaaaac 240
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tcctctttat tactattttc atgcgaggtt gccatgtaca ttatatttgt aaggattgac 360
gctattgagc gtttttcttc aattttcttt attttagaca tgggtatgaa atgtgtgtta 420
gagttgggtt gaatgagata tacgttcaag tgaagtggca taccgttctc gagtaaggat 480
gacctacca ttcttgagac aaatgttaca ttttagtata agagtaaaat gtgtacctat 540

aactcaaatt cgattgacat gtatccattc aacataaaat taaaccagcc tgcacctgca 600
tccacatttc aagtattttc aaaccgttcg gtccttatcc accgggtgta acaagacgga 660
ttccgaattt ggaagatttt gactcaaatt cccaatttat attgaccgtg actaaatcaa 720
ctttaacttc tataattctg attaagctcc caatttatat tcccaacggc actacctcca 780
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Met Ala Ser Ser Met
1 5
ctc tct tcc gct act atg gtt gcc tct ccg gct cag gcc act atg gtc 1242
Leu Ser Ser Ala Thr Met Val Ala Ser Pro Ala Gln Ala Thr Met Val
10 15 20
gct cct ttc aac gga ctt aag tcc tcc gct gcc ttc cca gcc acc cgc 1290
Ala Pro Phe Asn Gly Leu Lys Ser Ser Ala Ala Phe Pro Ala Thr Arg
25 30 35
aag gct aac aac gac att act tcc atc aca agc aac ggc gga cgc gtt 1338
Lys Ala Asn Asn Asp Ile Thr Ser Ile Thr Ser Asn Gly Gly Arg Val
40 45 50
aac tgc atg tct aga atg cca tcc gag tcg tca gac gca gct cgt cct 1386
Asn Cys Met Ser Arg Met Pro Ser Glu Ser Ser Asp Ala Ala Arg Pro
55 60 65
gcg cta aag cac gcc tac aaa cct cca gca tct gac gcc aag ggc atc 1434
Ala Leu Lys His Ala Tyr Lys Pro Pro Ala Ser Asp Ala Lys Gly Ile
70 75 80 85
acg atg gcg ctg acc atc att ggc acc tgg acc gca gtg ttt tta cac 1482
Thr Met Ala Leu Thr Ile Ile Gly Thr Trp Thr Ala Val Phe Leu His
90 95 100
gca ata ttt caa atc agg cta ccg aca tcc atg gac cag ctt cac tgg 1530
Ala Ile Phe Gln Ile Arg Leu Pro Thr Ser Met Asp Gln Leu His Trp
105 110 115
ttg cct gtg tcc gaa gcc aca gcc cag ctt ttg ggc gga agc agc agc 1578
Leu Pro Val Ser Glu Ala Thr Ala Gln Leu Leu Gly Gly Ser Ser Ser
120 125 130
cta ctg cac atc gct gca gtc ttc att gta ctt gag ttc ctg tac act 1626
Leu Leu His Ile Ala Ala Val Phe Ile Val Leu Glu Phe Leu Tyr Thr
135 140 145

ggt cta ttc atc acc aca cat gac gca atg cat ggc acc ata gct ttg 1674
 Gly Leu Phe Ile Thr Thr His Asp Ala Met His Gly Thr Ile Ala Leu
 150 155 160 165
 agg cac agg cag ctc aat gat ctc ctt ggc aac atc tgc ata tca ctg 1722
 Arg His Arg Gln Leu Asn Asp Leu Leu Gly Asn Ile Cys Ile Ser Leu
 170 175 180
 tac gcc tgg ttt gac tac agc atg ctg cat cgc aag cac tgg gag cac 1770
 Tyr Ala Trp Phe Asp Tyr Ser Met Leu His Arg Lys His Trp Glu His
 185 190 195
 cac aac cat act ggc gaa gtg ggg aaa gac cct gac ttc cac aag gga 1818
 His Asn His Thr Gly Glu Val Gly Lys Asp Pro Asp Phe His Lys Gly
 200 205 210
 aat ccc ggc ctt gtc ccc tgg ttc gcc agc ttc atg tcc agc tac atg 1866
 Asn Pro Gly Leu Val Pro Trp Phe Ala Ser Phe Met Ser Ser Tyr Met
 215 220 225
 tcc ctg tgg cag ttt gcc cgg ctg gca tgg tgg gca gtg gtg atg caa 1914
 Ser Leu Trp Gln Phe Ala Arg Leu Ala Trp Trp Ala Val Val Met Gln
 230 235 240 245
 atg ctg ggg gcg ccc atg gca aat ctc cta gtc ttc atg gct gca gcc 1962
 Met Leu Gly Ala Pro Met Ala Asn Leu Leu Val Phe Met Ala Ala Ala
 250 255 260
 cca atc ttg tca gca ttc cgc ctc ttc tac ttc ggc act tac ctg cca 2010
 Pro Ile Leu Ser Ala Phe Arg Leu Phe Tyr Phe Gly Thr Tyr Leu Pro
 265 270 275
 cac aag cct gag cca ggc cct gca gca ggc tct cag gtg atg gcc tgg 2058
 His Lys Pro Glu Pro Gly Pro Ala Ala Gly Ser Gln Val Met Ala Trp
 280 285 290
 ttc agg gcc aag aca agt gag gca tct gat gtg atg agt ttc ctg aca 2106
 Phe Arg Ala Lys Thr Ser Glu Ala Ser Asp Val Met Ser Phe Leu Thr
 295 300 305
 tgc tac cac ttt gac ctg cac tgg gag cac cac aga tgg ccc ttt gcc 2154
 Cys Tyr His Phe Asp Leu His Trp Glu His His Arg Trp Pro Phe Ala
 310 315 320 325
 ccc tgg tgg cag ctg ccc cac tgc cgc cgc ctg tcc ggg cgt ggc ctg 2202
 Pro Trp Trp Gln Leu Pro His Cys Arg Arg Leu Ser Gly Arg Gly Leu
 330 335 340
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 Val Pro Ala Leu Ala
 345
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 gcatgtaata attaacatgt aatgcatgac gttatttatg agatggggtt ttatgattag 2437
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<211> 346

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: deduced fusion protein of
transit peptide + peptide with beta-carotene C-4 oxygenase activity

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Gln Ala Thr Met Val Ala Pro Phe Asn Gly Leu Lys Ser Ser Ala Ala

20 25 30

Phe Pro Ala Thr Arg Lys Ala Asn Asn Asp Ile Thr Ser Ile Thr Ser

35 40 45

Asn Gly Gly Arg Val Asn Cys Met Ser Arg Met Pro Ser Glu Ser Ser

50 55 60

Asp Ala Ala Arg Pro Ala Leu Lys His Ala Tyr Lys Pro Pro Ala Ser

65 70 75 80

Asp Ala Lys Gly Ile Thr Met Ala Leu Thr Ile Ile Gly Thr Trp Thr

85 90 95

Ala Val Phe Leu His Ala Ile Phe Gln Ile Arg Leu Pro Thr Ser Met

100 105 110

Asp Gln Leu His Trp Leu Pro Val Ser Glu Ala Thr Ala Gln Leu Leu

115 120 125

Gly Gly Ser Ser Ser Leu Leu His Ile Ala Ala Val Phe Ile Val Leu

130 135 140

Glu Phe Leu Tyr Thr Gly Leu Phe Ile Thr Thr His Asp Ala Met His

145 150 155 160

Gly Thr Ile Ala Leu Arg His Arg Gln Leu Asn Asp Leu Leu Gly Asn

165 170 175

Ile Cys Ile Ser Leu Tyr Ala Trp Phe Asp Tyr Ser Met Leu His Arg

180 185 190

Lys His Trp Glu His His Asn His Thr Gly Glu Val Gly Lys Asp Pro

195 200 205

Asp Phe His Lys Gly Asn Pro Gly Leu Val Pro Trp Phe Ala Ser Phe

210 215 220

Met Ser Ser Tyr Met Ser Leu Trp Gln Phe Ala Arg Leu Ala Trp Trp

225 230 235 240

Ala Val Val Met Gln Met Leu Gly Ala Pro Met Ala Asn Leu Leu Val

245 250 255

Phe Met Ala Ala Ala Pro Ile Leu Ser Ala Phe Arg Leu Phe Tyr Phe
260 265 270

Gly Thr Tyr Leu Pro His Lys Pro Glu Pro Gly Pro Ala Ala Gly Ser
275 280 285

Gln Val Met Ala Trp Phe Arg Ala Lys Thr Ser Glu Ala Ser Asp Val
290 295 300

Met Ser Phe Leu Thr Cys Tyr His Phe Asp Leu His Trp Glu His His
305 310 315 320

Arg Trp Pro Phe Ala Pro Trp Trp Gln Leu Pro His Cys Arg Arg Leu
325 330 335

Ser Gly Arg Gly Leu Val Pro Ala Leu Ala
340 345